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‘The place is suffering’: enabling dialogue between students’ discourses and academic literacy conventions in engineering.

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Abstract

Students need access to the disciplinary practices of engineering, but at the same time, these practices need to transform to the realities of the changing global environment and the profession. The site of this research is an engineering foundation programme for less advantaged students in South Africa and is thus perhaps well-positioned to look afresh at some mainstream disciplinary practices. Rather than students conforming to a narrow sense of appropriate behaviour, a dialogue needs to be set up between what students bring and what the institution expects, in order to evolve innovative spaces within the curriculum. This paper explores what these spaces can offer and looks at how students negotiate complex identity positions in their writing, specifically in terms of agency and affect. It emphasizes that both educators and engineers need to learn to draw on own knowledges and experiences rather than imposing knowledge in a top-down process.

Key words

Disciplinary discursive practices, academic literacies, agency and affect in student writing, experiential knowledge

Introduction

My interest in this research began while teaching a Communication Course, focusing on academic literacy practices, to first year engineering students in a South African tertiary institution. The course is designed around a particular project, namely rural development. The students investigate the infrastructural and developmental needs of a rural settlement known to them, concentrating on aspects such as power, transportation, housing, water and sanitation. The idea is to introduce the concept of sustainability to the students – seeing engineering as creating a more socially just and environmentally sustainable world for now and for future generations. Their proposals for the development of a rural village take the form of a written report and a team-produced poster. In looking at the students' texts, I became interested in the range of discourses that the students were drawing on. For instance, many of the texts revealed an assumption that technological advancement can address social ills and thus conveyed a sense of technology as not being separate and abstracted from people's lives. It became clear to me that many engineering curricula may not necessarily have the space or the language to deal with these assumptions. I became interested in seeing how students' ways of representing are similar to and different from those valued by certain academic practices in engineering.

In this paper, I argue for the creation of spaces within the engineering curriculum, which can enable a range of discourses to emerge and to be utilized for the benefit of both the students and the discipline. I firstly look at some of the current valued discursive practices in engineering (painted with broad strokes and generalized across different types of engineering) before looking at students' interactions with them in the reports they write for a first year Communication Course on rural development. I

explore the ways in which students draw on multiple discourses in order to establish their agency in the material world, utilize their experiential knowledge and grapple with the discourses of development.

Features of engineering discursive practices

Although engineering is often defined in opposition to science (as applied, problem-solving, industry-based), the discourses of scientific practices are often assumed to constitute those of engineering. This can prove to be problematic in an applied discipline as scientific discourse tends to function on a hierarchy of epistemologies and thus serves to create a disjunction between everyday commonsense knowledge and the systematized knowledge of the discipline. According to Lemke, the language of scientific discourse “sets up a pervasive and false opposition between a world of objective, authoritative, impersonal, humourless scientific fact and the ordinary, personal world of human uncertainties, judgements, values and interests” (1990, pp. 129 – 30).

Bernstein describes this opposition in terms of the notion of ‘recontextualization’. He suggests that ‘pedagogic’ discourse is constructed by “a recontextualizing principle which selectively appropriates, relocates, refocuses and relates other discourses to constitute its own order” (1996, p.47). In this process of relocating a discourse (taking a discourse from its original site of effectiveness and moving it to a pedagogic site), a gap is created and a transformation takes place. The example he uses is the following: outside pedagogy there is carpentry, but inside pedagogy there is woodworking.

Bernstein emphasizes the ideological nature of this transformation, as do Halliday and Martin (1993), although they also explore the affordances of this ‘pedagogic

discourse'. They argue, for instance, that the language and discourse of science have characteristic features that have evolved to do various forms of cognitive and semiotic work which the 'common-sense' language of everyday life cannot do as well, such as representing technicality and abstraction.

What seems to be specific to engineering discursive practices, as distinct from scientific discourse, is a particular way of arguing, which links the abstract to the context-specific by weighing up phenomena against certain set criteria. This way of arguing is linked to the activity of 'design' which is central to engineering practice. The design process involves identifying a problem and defining the characteristics of an acceptable solution according to a set of stated criteria. Alternative approaches to solving the problem need to be generated and reviewed against the specification, then a preferred solution needs to be decided on, documented and communicated (Johnston, Lee, McGregor, 1996). As Wulf succinctly puts it, engineering is "design under constraint" (2004, p.13). Although, like in scientific discourse, engineering comprises scaffolding of deductive and inductive reasoning, formulating hypotheses, making generalizations, identifying exceptions, connecting evidence, classifying and organizing, it is this notion of design which moves engineering discursive practices away from the realm of abstraction and links argument to the material world in a way that scientific discourse does not always do.

Also, within engineering educational arenas, there has begun to be an acknowledgement of the limitations of a reliance solely on science to define engineering activity. The Engineering Council of South Africa (ECSA) has emphasized generic abilities such as problem solving, analysis, communication and

teamwork in a multidisciplinary environment (2004). In this, there is a recognition that social needs and pressures shape engineering as much as it, in turn, shapes society. It follows that engineering is constituted by a number of discourses that exist simultaneously and in some tension with each other, such as management, economics, sociology, politics, and development. As mentioned earlier, this paper is an argument for the need to review the inclusion of this full range of discourses in spaces created within the curriculum in order to expand the currently available ways for engineers to define themselves and their work. I will now look at the Communication Course in more detail and explore the student writing produced, in order to identify how the students position themselves in relation to the subject content of rural development.

Identifying students' discourses in a first year Communication Course

In South Africa and internationally higher education has been undergoing a major transformation. Although much has been done since 1994 to redress social injustices in secondary education in South Africa, the legacy of apartheid is still prevalent in a non-equitable educational system. Students enter the university from a wide variety of educational and language backgrounds. Students who have not had practice in the more cognitively demanding and abstract tasks provided by quality schooling can sometimes be at a disadvantage. In an effort to address the realities of educational transformation, most South African tertiary institutions developed 'academic development' programmes. Academic development initiatives are a locus for change which attempt to transform the teaching and learning processes, to encourage academic excellence, whilst democratizing and extending access to education. Initially, the academic development initiatives in the mid 1980's involved providing

language ‘support’ to students which was not always integrated into the curriculum, but was seen as something ‘added on’. After 1990 there was a critical turning point in the curriculum debates inside South Africa. There was a shift to integrate academic literacy and language competencies into the curricula of the disciplines in a more developmental approach.

The site of this study is an engineering foundation programme for less advantaged students in a South African tertiary institution. The programme structures the students’ learning experience by extending their period of study and including extra courses in the content curriculum. This includes a year long course entitled ‘Introduction to Communication’ and enrolment ranges between 80 – 100 students each year. Most of the students have English as an additional language and the course concentrates on developing academic literacy in English. The Communication Course aims to ensure that less advantaged students who have been admitted to the university have a fair chance of success. The curriculum design, therefore, takes the students’ backgrounds and schooling into consideration, as well as the new discourses they encounter in the tertiary environment. For this reason, this course is well-positioned to explore how students draw on and utilize a range of discourses, perhaps more so than a more ‘mainstream’ course.

Engineers are expected to work effectively in teams, across hierarchies and across disciplines (ECSA, 2004, p.6). This is part of a global shift in workplace literacies (Gee, 1996; Lankshear, 1997). Also, within the specific context of South Africa’s history of racial discrimination, diversity is a key curricular issue requiring specific attention. The Communication Course thus attempts to harness diversity as a

classroom resource, particularly the rural / urban divide and class divisions which are a major source of difference in a developing country like South Africa. The rural focus is one way of engaging with, legitimating and giving authority to the experiences of the students from rural areas and informal settlements. Expert-novice relations are established between rural students who know the chosen area and those who do not. Also, each consultant researches one aspect of rural development and shares it with the other group members. The premise underlying these expert-novice relations is Lave and Wenger's argument that learning is not located in the acquisition of structure, but in the increased access of learners to participating roles in expert performances (1991, p.7). Groups made up of people from different social backgrounds, who do not share the same 'common sense', are unlikely to have the same interpretations of texts and situations. These multilingual, multicultural, mixed gender groupings provide an ideal environment in which students can test their own readings against those of others.

The students are required to write an investigative report in which they propose suggestions for development of the particular area. The format of the report has specified and defined sections which are explicitly taught. These include the terms of reference, synopsis, table of contents, introduction, findings, analysis and discussion, conclusions, recommendations, acknowledgements and bibliography. In this paper, I concentrate my analysis on the reports of three students: Mbongiseni, Mthoko and Andrew. These three students speak Ndebele, Sepedi and Zulu respectively, and all come from rural areas in South Africa. In analyzing their writing, I first explore the ways in which they navigate academic discourse in terms of establishing their agency in the material world. Secondly, I look at the ways in which they include experiential

knowledge in their reports. Finally, I identify which discourses they are drawing on and propagating, specifically around ‘development’. In doing this analysis, I also take cognisance of the fact that while students are struggling with content and identity issues, they are also struggling with the usage of formal, condensed forms of written English.

In their writing, the students draw on discourses from the many socio-cultural domains of their lives. In line with Fairclough (1992), Gee (1996) and Kress (1985), I use the term discourse to signal more than ‘language in use’, but to describe a type of social practice. Gee refers to discourse as socially embedded “saying (writing) – doing – being – valuing – believing combinations” (Gee 1990, p.142) and distinguishes between primary and secondary discourses. The primary discourses are those which people acquire early in life within the socio-cultural setting of the family. These discourses constitute the first social identity and provide the base for acquiring or resisting later discourses. Secondary discourses are those that have to be learnt as a part of socialization within local, state and national groups outside of the home (Gee, 1996, p.137). They are more public and formal, such as religious discourses and schooling discourses. Students draw on both primary and secondary discourses in learning the discursive practices of the institution, and traces of these are evident in their texts, where marginalized or oppositional discourses jostle against privileged discourses. It is these moments of dialogic rub in the students’ reports that are of interest to me. They often revolve around varying degrees of authorial agency (the extent to which the author is positioned as an actor in the text, usually marked by degrees of tentativeness or assertiveness, and the use of the personal pronoun ‘I’) and affect (degrees of engagement with and evaluation of the subject matter).

Degrees of agency and affect in student writing

According to Gee, the author is often down played in academic discourse “since the process of writing and editing essayist texts leads to an effacement of individual and idiosyncratic identity” (1990, p.63). Academic discourse is thus often realized through the passive form where agency is removed and an authorial distance created, in sentences such as “The village is developed by engineering consultants” or “The village is developed”. When the process or object is foregrounded, rather than the agent, the agent is often discarded altogether: “About 200 stand taps were suggested to be installed” (Mbongiseni). This passive transformation inverts the order of actor and affected. Here the ‘stand taps’ are foregrounded as the subject of the sentence, and ‘suggested’ and the agency it implies is not emphasized.

Although the students often used the passive form in order to foreground process, this did not necessarily remove agency from themselves or from the villagers. The grammatical awkwardness of some of their passive constructions is a result of these sometimes conflicting agendas. The writing in Mthoko’s report vacillates between removing agency completely and instituting some record of active decision-making: “Nobody and Co. consultants found it to be better if a research is made about a kind of road which can be constructed in Nobody Village.”¹ Although two passives without agents are embedded in this sentence (“research is made” and “can be constructed”), these are framed by the opinions of the actors ‘Nobody and Co. consultants’, which are foregrounded. A vacillation of agency is also evident in Mbongiseni’s report, where he switches between focusing on process and focusing on

¹ When quoting from students’ writing, I have not altered the grammar or spelling in any way.

agency: “More water supply systems are required in the village as requested by the village inhabitants”. The grammatical difficulty in this sentence construction could be because Mbongiseni realizes the need to remove agency, but wants to keep a human face on the development and to demonstrate that it is the villagers themselves who have requested this development. The team of consultants are represented as having “decided to upgrade the conditions regarding water and sanitation in Nobody Village”, thus producing a strong sense of agency and authorial proximity. Here involvement in rural development is represented as an active choice rather than a passive construction of having “been commissioned” to do the work. This ambiguity of agency in the students’ writing could have something to do with their positioning as members of different and sometimes conflicting communities. They form part of a rural community, as well as a student community. They are also beginning to be part of an engineering community, a role which is fore-grounded by role-playing professional engineering consultants. Within this complex terrain, it appears that students sometimes battle to find their ‘voice’.

Alongside agency, it is interesting to observe how affective dimensions surface in the written reports. Affect often manifests in traces of other discourses within the dominant scientific discourse and is realized through particular typographical choices (for instance, bold face type and italics are often used for intensification) and lexicogrammatical constructions (for instance, the use of the active voice, personal pronoun ‘I’ or emotive lexis). There are moments in Mthoko’s report where a strong sense of engagement is evident. For example, “The place is suffering from poor supply of water (*a major resource in life*)”. He uses italics to emphasize the importance of water. The shift to the present continuous tense here (from the simple

present) indicates that the suffering is happening now, even as the author writes the report. The choice of a word like ‘suffering’ refers to emotional lexis and has provenance in religious and literary genres of a certain kind as well as ordinary everyday life. Although this shift in lexis is unusual in the Western scientific discourse of tertiary institutions, it is not necessarily an indicator of a shift in discourse, but rather points to the influence or ‘trace’ of another discourse. Instead of the word ‘suffering’, the student could have used a term like ‘disadvantaged’, ‘lacks’ or ‘ill supplied’. Each of these words indicates a different discursive provenance. The present continuous tense, emotional lexis, and the active form contribute to the degree of engagement in this statement. Of course, these choices could be a function of writing in a second language. Mthoko’s engagement could also be due to the fact that he grew up in the village which he is investigating and has personally experienced the ‘suffering’ due to the poor infrastructure.

Affect can be realized through degrees of evaluation, judgement or appraisal. For instance, a description in Mbongiseni’s report is coupled with evaluation and appraisal.

This project will mainly focus on the redesigning of water systems made from locally available materials than can be used by local craftsmen. This will work well since will be fine-tuned to the local area, its people and its craftsmen’s capabilities.
(Mbongiseni)

Instead of letting the match of suggestion to the criteria (local materials, local development, cost effectiveness) speak for itself, he passes evaluative comment on how good this will be for the area and its people, using the evaluative adverb ‘well’ and the adjective ‘fine-tuned’. Elsewhere he uses grammatical choices to represent

evaluative qualities in a ‘technologized’ way, so the adjective ‘efficient’ becomes the abstraction, ‘efficiency’. The term ‘efficiency’ points to the discursive provenance of economics: “Technology has improved production efficiency”. Thus, evaluation becomes an abstraction and a timeless truth without context. Turning attitudes into abstract qualities is one way of sounding objective while still presenting a point of view.

It is clear that the students have negotiated complex identity positions in their writing in relation to variable degrees of agency and affect. It is important to highlight to students that couching argument in depersonalised academic discourse does not necessarily reduce the strength of the writer’s conviction. In order to understand academic practices, it is necessary to realize that it is possible to insert one’s own identity or ‘voice’ in textual representations, and that the texts one encounters are not neutral, but are ideologically laden from particular perspectives. This awareness is part of becoming both a critical producer and interpreter of texts.

Reconciling experiential knowledge with researched knowledge

The students draw on both experiential and researched knowledge in writing their reports. Experiential knowledge (such as the description of the village) draws on ‘common sense’ whereas researched knowledge is more abstract in orientation (such as construction design), drawing on systemized knowledge embedded in engineering disciplinary practices. The genre of realization for experiential knowledge tends to be description which describes the ‘how’ and the ‘what’. For instance, the following procedural piece about the filling up of the toilet system:

How long does it take for a hole to get full?

After about 10 – 15 years the hole fills up. Another hole is then dug by its side and the connection is given from the ceramic toilet basin to the new hole. Thus the toilet room/ make-shift hay room is left untouched. At a convenient time the filled up hole is emptied since the stuff in it would have decayed into sweet smelling organic manure, repaired and reused when the new hole fills up. (Mbongiseni)

The procedure refers to concrete and material processes based on experiential knowledge. It is written using the lexical and grammatical constructions of the everyday. Choice of lexis like ‘hole’, ‘stuff’ and ‘sweet’ point to this common, everyday quality. Researched knowledge, on the other hand, is represented through the use of tables, passive constructions, distanced authorial voice and low degrees of affect and evaluation. The organization of researched knowledge is through scientific argument, often involving classification hierarchies.

When describing the context of the village, the students drew predominantly on experiential or general knowledge of rural villages, either their own or that of fellow students. However, it is clear that some were uncomfortable with drawing on their own knowledge, perhaps because the assignment required them to use secondary sources. Angelil-Carter asks the question: “Whose general knowledge counts? Who is assumed to have the authority?” (2000, p.172). Hence, when Mthoko describes the natural environment of Nobody Village, his hometown, instead of intuitively saying what the average temperature and rainfall is, he refers to a website. This website provides facts about another town, Pietersburg, and he concludes that since Nobody

Village and Pietersburg are in close proximity and are at the same altitude, their climactic patterns should be pretty similar.

It is found that Pietersburg lies on 1312m altitude and has a pleasant climate with temperature averaging 27 degrees Celsius in summer and 20 degrees Celsius in winter (CLIMATE AND SPORT AMENITIES web page) from page 2 of 4 in the first paragraph. Therefore, it can be claimed that Nobody has the same climate and weather since they are close to each other. (Mthoko)

He goes through processes of deduction based on research done on the internet, and this research is foregrounded, rather than the experience of someone who lives in the area. He also takes care to reference the location of the information, albeit in an unorthodox way. This is clearly an example of a student battling with authority and attribution and the academic conventions surrounding these.

The ‘acknowledgement’ sections in the reports seem to have been appropriated by the students as a place where they can acknowledge friends and community as knowledge sources. In Mthoko’s report, the acknowledgement is placed before the bibliography, which perhaps prioritizes the community as knowledge source above other sources, such as books and websites.

Nobody and Company consultants would like to thank Nobody Village community for making it possible to have enough information about their village in the Climate and Amenities web page. (Mthoko)

This acknowledgement shows a certain lack of awareness about who owns information, who produces and distributes it. It is not ‘the Community’ as a monolithic entity that produced the website, but perhaps a faction within it or outsiders. Other students also acknowledge the community for providing information. According to one student, “The given information was provided by the neighbouring farmer and the people of Ingogo Village and thanks to them the existing infrastructure was easily obtained”, and another, “The village on Ingogo was of great help in providing relevant information during the investigation of this report”. In one of the most interesting cases indicating a clash between student knowledge and academic conventions, a student included the names of four people and their street addresses as a part of her bibliography. She had pursued certain contacts and wished to indicate this extra research in her report. Referencing addresses of websites is the norm, and if referencing of personal communications is becoming increasingly prevalent, it is not surprising that she felt the need to reference the physical addresses of people with whom she had been in personal contact (See Archer, 2005). This acknowledgement of the community as source of information is not standard in academic referencing conventions, and yet it would seem that the students are correct in wishing to reference this knowledge source, along with the internet sources. Perhaps this indicates the degree to which academic discourse has to ‘catch up’ with changing academic needs.

Exploring discourses of ‘development’ and contradictions within these

I now move on to look at the discourses of development that students draw on and, in turn, propagate in their texts. As I mentioned earlier, texts reflect and recycle different

discourses, some of which may complement each other and others may represent conflicting interests and ideologies. There are many contradictions and tensions evident in the discourses of development in the students' texts. Sometimes these texts espouse democratic inclusion. At other times, authoritarian and uni-directional discursive constructions create a distance between the engineers and the villagers, where development is construed as 'aid' or as addressing a perceived 'lack'. The discursive conflicts around development are visible in two issues: representations of 'us' and 'them', and the conflict between students' emerging identities as engineers and their previous identities as rural people. These conflicts sometimes result in ambivalent representations of the villagers.

An uneasiness about 'us' and 'them' is revealed in Mbongiseni's report. The engineers are clearly constructed as 'us', an in-house group of which he forms an integral part: "Few workmen in the village will be elected to help us in the process". At times in his report there is a blurring between the roles of engineers and the roles of villagers, and sometimes a clear divide is highlighted where the engineers are constructed as 'solving' the villagers' problems. The blurring of identity between the 'engineers' and the 'villagers' is indicated in the following statement: "The stand taps (standpipes) and windmills were the main suggestions by the villagers to solve the problem of water in the area." Another example of this is the following:

After the villagers had had a chance to explore their village, it was suggested that domestic animals should be moved away from near the houses to the own places. (Mbongiseni)

In both these examples, the agent is ambiguous. It is unclear whether the villagers or the engineers made the suggestions. Perhaps this ambiguity of roles reflects on Mbongiseni's emerging identity as an engineer, but also the identity of someone who comes from a rural area himself (from KwaNdebele in Mpumalanga). This straddling and shifting of identities must be a common experience for first year students.

The predominant use of strong modals² in the students' writing, such as 'must' and 'should', could indicate that they role-play themselves as qualified, both in this particular project and in academic practices. However, although a sentence may have the grammatical construction of a command, it may not necessarily have the force of a command.

Some of the villagers are catching sickness from the domestic animals like chicken and cattle, so it was suggested that they *must* be moved to their own areas. (Mbongiseni, emphasis added)

There are two separate clauses here: "it was suggested that" and "they must be moved to their own areas". The first one suggests and the second one commands. It would thus appear that a 'suggestion' is in fact a 'command' here, thus conflicting with the democratic aspirations of the writing. However, the force of the statement is not that of a strong command. In order to establish the force of a command, one needs to make inferences about who the speaker is. Here, the student lacks the authority to create a command, even if the lexicogrammatical construction points to an authoritative position (for instance, the use of the passive form: "it was suggested that ..."). It is

² 'Modals' refers to a part of a multi-word verb which indicates the degree of commitment to an hypothesis, such as 'may' or 'must'. A 'strong modal' indicates a strong commitment.

worth noting that, in general, EAL speakers in South Africa tend to battle in choosing appropriate modal auxiliary verbs (Lass, 2002). ‘Must’ here actually has the modality of ‘should’, and the student could be using it in a way that is typically South African, namely as a suggestion and not a command. Lass has described this feature of South African English amongst first language speakers as well.

In the students’ reports, it appears that strong identification with the role of consultant engineer enables more of a distance from the issues of development. This sometimes results in complex constructions of the ‘other’. Although the course emphasizes sustainable development arising out of communities, the students’ reports reveal a range of perspectives and individual texts are often shot through with internal contradictions. So, inclusion in democratic processes is emphasized whilst couched in an ‘us’ and ‘them’ orientation, or in condescending discursive structures. Development as organically arising out of local needs and resources to ensure sustainability is juxtaposed with a notion of development as ‘aid’ or ‘help’ – something that comes from outside a particular community.

Enabling dialogue between student discourses and academic conventions

In devising a critical and transformative curriculum, it would be important to ascertain the primary discourses and different kinds of secondary discourses of students, and examine the ways in which students utilize and adapt these in the engineering context where highly specialized secondary discourses are required. Engineering as an academic discipline is well-placed to bring different discourses alive, as it is premised on engagement with the material conditions of people’s lives. Discussing students’

contradictory perspectives on development as part of the curriculum could create awareness of how ideology functions and encourage students to interrogate their own ideological positions.

Perhaps dialogue between students' discourses and academic conventions tends to happen more organically in a humanities environment where students are encouraged to reflect on both their personal and societal practices. In traditional first year engineering courses, knowledge tends to be compartmentalized into bounded subjects like maths and physics, and these are not always applied directly to real world contexts. A curriculum which draws on students' experiences and discourses could be invaluable in this context, as it provides an opportunity for students to begin to interrogate their past situations as well as their aspirations. They also start to think critically of engineering as a profession within the context of South Africa. This kind of curriculum coheres with an international shift in the discipline towards the affective, the subjective and more 'humanities' type concerns. There is a trend to create a balance between technical and non-technical aspects in engineering education and curricula designs worldwide (Wulf, 2004; Horack, 2003; Bugliarello, 1991). Evident in this trend is the acknowledgement that engineering is a social activity with political, ethical and economic dimensions. Cognisance needs to be taken of various social aspects of engineering and their semiotic realization, such as the tensions between tradition and development, nature and society. According to Beder, "there is an increasing need for engineers to choose technological solutions that are appropriate to their social context and to give consideration to the long-term impacts of their work" (1999, p.13). The broadening of engineering to include the humanities and the

related social sciences is echoed in other professional disciplines, particularly in medical education (Evans, 2002; Kneebone, 2000; Charon, 2001).

Affect is not necessarily valued in the discipline of engineering in the same way it is in the humanities, yet, as I have shown, it emerges in the students' texts, often in traces of other discourses within the dominant scientific discourse. Alerting students to these traces could make them aware of how affect is a part of academic discourse, but often takes a different form than that of the 'everyday' (see Archer, 2006). For instance, the 'criteria' of an engineering design project constitute the underlying belief system or ideology of the resultant text and often take the grammatical form of the imperative. The pedagogical aim would be to make students more aware of the ways in which they construct scientific academic discourse, and the ways in which they can, and already do, insert their own voice into their textual representations.

I have examined the representational choices students made in producing their reports and the extent to which these choices match that which is valued in academic discourse. The unfamiliarity with the report genre and the difficulties around imitation of academic discourse, the distinction between general and attributable knowledge and the lack of deep understanding of the construction of academic knowledge led to the emergence of some mixed generic forms. Bernstein (1996) points out that power is maintained and relayed through the creation of boundaries between practices, and it is often in 'mixed' forms where power is played out. In my analysis of the students' reports, it is clear that reinterpreting some standard generic conventions often signals an encounter of diverse knowledges and differently organized social worlds. Instead of seeing these mixed forms as manifestations of incompetence and deficiency, they

can be used as the basis for a classroom discussion on the encounter between different lifeworlds – the students’ and the academy’s.

The study has attempted to highlight a disjuncture between the depersonalized narratives of professional discourse and the narratives of affect and suffering that are prevalent in rural and deprived contexts. The key question in terms of equity is how to provide access to dominant forms, while at the same time valuing and promoting the diversity of representational resources of our students and of the broader society. In order to enable access to dominant academic practices, the discursive and generic conventions of the discipline need to be made available to students. At the same time, students’ practices, resources and discourses need to be used and validated.

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References

Archer, A. (2006). A multimodal approach to academic ‘literacies’: problematizing the visual/verbal divide. *Language and Education*. 20, 6: 449 – 462.

Archer, A. (2005). Access and resistance: challenges of using on-line environments to teach academic discursive practices. *Education as Change*. 9, 2: 74 – 95.

Angelil-Carter, S. (2000). Understanding plagiarism differently. In B. Leibowitz and Y. Mohamed (eds.) *Routes to writing in Southern Africa*. Cape Town: Silk Road International Publishers.

Beder, S. (1999). Beyond technicalities: Expanding Engineering thinking. *Journal of Professional Issues in Engineering*. 125, 1: 12-18.

Bernstein, B. (1996). *Pedagogy, symbolic control and identity. Theory, research, critique*. London: Taylor and Francis.

Bugliarello, G. (1991). The Social Function of Engineering: A Current Assessment. In H. Sladovich (ed.) *Engineering as a social enterprise*. Washington D.C.: National Academy Press.

Charon, R. (2001). Narrative medicine: Form, function, and ethics. *Annals of Internal Medicine*. 134, 1. 83 – 87.

Engineering Council of South Africa (ECSA). (2004). Whole Qualification Standard for Bachelor of Science in Engineering (BSc (Eng)) / Bachelors of Engineering (BEng): NQF Level 7. Registered on the National Qualifications Framework: NLRD no 48694. Document: PE-61. 26 July.

- Evans, M. (2002). Reflections on the humanities in medical education. *Medical Education*. 36, 6. 508 – 513.
- Fairclough, N. (1992). *Discourse and social change*. Cambridge: Polity Press.
- Gee, J.P. (1990). *Social linguistics and literacies: Ideology in discourses*. London: Falmer Press.
- Gee, J.P. (1996). *Social linguistics and literacies: Ideology in discourses*. Second edition. London: Falmer Press.
- Halliday, M.A.K. and Martin, J.R. (1993). *Writing Science: Literacy and discursive power*. London: Falmer Press.
- Horak, E. (2003). A study of the thinking styles and academic performance of civil engineering students. *For Engineering Education*. 7, 1. 4 – 7.
- Johnston, S., Lee, A., and McGregor, H. (1996). Engineering as captive discourse. *Philosophy and Technology*. 1: 3 – 4.
- Kneebone, R. (2000). Total internal reflection: an essay on paradigms. *Medical Education*. 36, 6. 514 – 518.
- Kress, G. (1985). *Linguistic processes in sociocultural practice*. Oxford: Oxford University Press.

Lankshear, C. (1997). *Changing literacies*. Buckingham, UK/Philadelphia: Open University Press.

Lass, R. (2002). South African English. In R. Mesthrie (ed.) *Language in South Africa*. Cambridge: Cambridge University Press.

Lave, J. and Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge: Cambridge University Press.

Lemke, J.L. (1990). *Talking Science: Language, learning and values*. Norwood, NJ: Ablex.

Wulf, W.A. (2004). Some thoughts on Engineering as a humanistic discipline. *International Journal of Engineering Education*. 20, 3. 313 – 314.